Bootstrapping Intimate Collaborators

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We are interested in how small groups of remote intimate collaborators --- distance-separated people who want or need to stay in touch with each other --- bootstrap their software environments and social practices to enable interaction. In this presentation, we will reflect on our personal experiences bootstrapping a collaborative environment between the co-authors as intimate collaborators, and between Greenberg and his students while he was on sabbatical leave to Australia from Canada for several months.

Initially, Greenberg and several of his colleagues and students had installed and configured Teamwave Workplace (www.teamwave.com), a rich groupware environment based on a room metaphor, on their computers (Roseman and Greenberg 1996). While their activities over Teamwave in the first few weeks included exchanging documents, ideas and comments, they gradually stopped using it. We believe this was because Teamwave was heavy-weight: if a person wanted to see if other collaborators were present (necessary for opportunistic interaction, see Kraut, Egido and Galegher 1988), one had to log onto the system, and a quite large window had to be kept running on the display. As well, it was hard to tell except by close visual inspection if anyone had changed anything in a room since the last visit. This made it difficult for people to stay aware of what others had done and to respond to those changes (see Greenberg, Fitzpatrick, Gutwin and Kaplan 1999 for further discussion).

At the same time, several of us developed 'web-cam software' that could automatically take periodic snapshots (e.g., an image that changed every half-minute) of a person and post it as a file on a web site and thus accessible by URL. While such systems are in fairly regular use (e.g., Lee, Girgensohn and Schlueter 1997), what was interesting is how we bootstrapped and adopted it to our use. We should mention that our adoption of the system was emergent: we had not planned or agreed to use this system between us, and no one helped set the system up ahead of time.

In the beginning, one person (Kuzuoka) built a version of this system, and used it to create a personal web page of himself i.e., the page included an individual periodic snapshot plus textual description. That system was not passed onto others because it used a mix of hardware and software difficult to replicate. The next version, created by Greenberg and his student Boyle, had similar functionality to Kuzuoka's system except that it ran on a standard operating system (Windows) and would work with most off-the-shelf desktop video cameras. This software was relatively easy to send to others. As a consequence, several of us created our own personal Web cam pages, and we would then send the URL of that page to others. Over time, people transformed their individual page into a 'sub-community' page, where people began to include on their page periodic snapshots (via URLs) of the other people they were interested in. That is, one person's sense of community often differed from others, which was reflected in who appeared on a person's page. Thus the standard practice that emerged was that a person who had installed a web-cam would send the URL of their periodic snapshot to others, who would then selectively add that snapshot (via the URL) to their sub-community page if they wanted to. Note that the HTML of the original sub-community page was readily available for others to copy and modify to their own use: people did not have to try and create a personal page from scratch. An example illustration of Greenberg's page, which includes periodic snapshots of myself and three other people, is illustrated below. Two of us are present, the 3rd is away from his desk (the darkness shows that it is night-time), while the fourth has 'logged off' from the image capture system.

In contrast, we did not use a custom system that Greenberg had built because (unlike the exchange of URLs) it required more than a moment's effort to install. While Greenberg's system presented a better view of a person's availability (it included a graph of people's presence over time), the software took time to download, and installation took about 10 minutes. Similarly, we tried but gave up on Microsoft NetMeeting. It was more complex to install and configure, and it was not robust: for whatever the reason (which could include poor network response or our own faulty installation), video rarely worked, and audio was questionable.

In parallel with the web cam, we began to use Microsoft Messenger (http://messenger.msn.com/), a system that displays peoples' presence (by showing if they are active on their computers) and that lets people engage in chat sessions with others by clicking on particular names. While we had other systems (even some that we had built) that did the same thing --- and arguably that did it better --- Messenger won out for several reasons. First, it was easy to install: a web page URL click followed by a short Wizard dialogue. Second, it was robust to start and use: the server was universally available, light-weight security precautions did not inhibit its use, it was always up, and connections (almost) always worked. Third, it was easy to tell others how to join it: Messenger includes the ability for one person to send an invitation to another person via a boilerplate email message. This message instructs them on how to get and install the system and how to add the invitee to the list. Finally, Messenger had a small visual footprint: its small window meant that people were willing to keep it permanently on display.

We then evolved our joint use of the sub-community pages and Messenger. For example, we found ourselves using Messenger to see if anyone was around, and if they were, of starting or raising the sub-community web page. (Because the webcam page had a larger visual footprint, it was not always on display or it was often covered by other windows). Intriguing was how we used the periodic snapshots --- originally created just to detect if another person was there --- for visual communication. We would wave to the other person (the snapshot was actually an animated GIF with two frames; thus one could quickly create a snapshot that would animate one waving back and forth---see first image below). We would make faces or capture gestures over the video to accentuate what we were saying over text (e.g., the 2nd image). We would sometimes introduce local people to the distant person by framing the group in the camera, taking a snapshot, and telling the other (via chat) who they were (3rd image). We would also leave status messages via video, such as a note in front of the camera saying that one was out for a coffee (final image).

In spite of its simplicity, the system worked quite well. Although there were extreme time differences, Greenberg regularly chatted to my students back in Canada: awareness of their occasional presence made this happen. Greenberg and Kuzuoka, located in Australia and Japan respectively, had many exchanges. These were both brief and lengthy, where we used the video and chat system not only for informal banter, but as a way to coordinate work. For example, one person would request something via messenger, the other would send it immediately via email, and the first would respond to the email via messenger. In contrast, a few of Greenberg's students back in Canada did not subscribe to this system. In spite of a similar need for reciprocal communication between them, the only interaction occurred via irregular email. Greenberg felt out of touch with students not on the system, and in touch with students on it.

In summary, there are several points learnt from these episodes on what helps intimate collaborators bootstrap their collaborations over distance. While they seem somewhat obvious in hind-site, we have to recognize that many current systems do not follow these simple points.

1. The system must be set up in a way that makes it easy for one person to tell others about it and how to get it.
2. People must be able to install and configure the necessary infrastructure for collaboration with almost no effort. High effort inhibits bootstrapping.
3. People must be able to connect to each other easily (e.g., the informal exchange of image URLs or addresses that occurred in the examples above).
4. People should be able to form and easily modify their own sub-communities. The intimate collaborator communities we are interested in are small, and ideas of who belongs in a sub-community is not necessarily shared by all members. For example, the people I added to my sub-community intersected but did not overlap completely with the sub-communities held by others.
5. People need to be aware of others presence, for this provides opportunities for interaction. However, the visual footprint of the awareness portion of the system must be small if people are to keep it always on.
6. People will adapt their communication medium in ways not envisaged by the designers. For example, we used the peridiodic snapshots as a communication medium even though it was designed only as an awareness device.

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References

Greenberg, S., Fitzpatrick, G., Gutwin, C. and Kaplan, S. (1999). **Adapting the Locales Framework for Heuristic Evaluation of Groupware.** *Proceedings of OZCHI'99 Australian Conference on Computer Human Interaction*, Wagga Wagga, NSW Australia, November 28-30.

Kraut, R., Egido, C. and Galegher, J. (1988) **Patterns of contact and communication in scientific collaboration.** *Proceedings of the ACM CSCW Conference on Computer-Supported Cooperative Work*, 1-12.

Lee, A., Girgensohn, A. and Schlueter, K. (1997) **NYNEX Portholes: Initial User Reactions and Redesign Implications Issues in Technology Supporting Learning**. *Proceedings of the ACM GROUP'97 International Conference on Supporting Group Work*, 385-394.

Roseman, M. and Greenberg, S. (1996). **TeamRooms: Network Places for Collaboration.** *Proceedings of ACM CSCW'96 Conference on Computer Supported Cooperative Work*.ACM Press.